

**ENHANCING UNDERGRADUATE PARTICIPATION IN  
OCEANOGRAPHIC RESEARCH WITH A FOCUS ON HISTORICALLY  
BLACK COLLEGES AND UNIVERSITIES/MINORITY INSTITUTIONS**

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**LONG-TERM GOAL**

To significantly enhance participation of underrepresented groups in careers in ocean sciences and ocean engineering.

**SCIENTIFIC OBJECTIVES**

To provide more opportunities for participation of underrepresented undergraduate students in ocean sciences and ocean engineering research experiences at Woods Hole Oceanographic Institution. With a focus on recruitment of undergraduates from Historically Black Colleges and Universities and Minority Institutions (HBCU/MI).

**APPROACH**

The proposed method will enhance the participation of undergraduate students in both Woods Hole Oceanographic Institution Summer Student Fellowship Program and the Minority Traineeship Program. These are established programs with a record of accomplishment of involving undergraduate science and engineering majors in research in ocean sciences and ocean engineering.

We will initiate the process of establishing joint research projects between faculty and students in Historically Black Colleges and Universities and Minority Institutions, and Scientific Staff and Senior Technical Staff at Woods Hole Oceanographic Institution. The initial phase will involve visits by a few WHOI Scientific Staff to HBCU/MIs selected in concert with the ONR Program Manager.

**WORK COMPLETED**

Please see tables in "results" section outlining 1997 recruitment efforts. Four trainees were selected and information concerning their school affiliation and projects are listed under results. Plans are being made for faculty visits to selected universities and colleges in conjunction with the current application period.

**RESULTS**

Participation in the Woods Hole Oceanographic Institute has been enhanced by the following additional minority trainees:

1. *ONR Supported Minority Trainees, 1997:*

- a) Sharat Gadde: Yale University, Biology Major, Junior, Advisor: Dr. Donald M. Anderson, WHOI Biology Department, Project: Development of an ELISA assay to quantify brown tide *Aureococcus anophagefferens* cells in field samples.

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- b) Sharon Perez-Suarez: University of Puerto Rico, Geology Major, Graduated Senior, Advisor: Dr. Henry J. B. Dick, WHOI Geology and Geophysics Department, Project: Cayman Trough: An End Member for the Structure of the Lower Crust of a Mid-Ocean Ridge?
- c) Leigh Torres: American University, Majors: Visual Media, Environmental Science, Graduated Senior, Advisor: Dr. Frank Manheim, USGS, Woods Hole, MA, Project: Mapping Sediment Substrate Environments in the Boston Harbor.
- d) Erica Wescott: Clark Atlanta University, Biology Major, Junior, Advisors: Dr. John W. Farrington, Senior Scientist, WHOI, Marine Chemistry and Geochemistry Department, Mr. Bruce W. Tripp, WHOI, Rinehart Coastal Research Center, Project: PAHs in Boston Harbor: Bioavailability, Trends and Evaluations.
2. *WHOI Minority Traineeship Program, 1978-1997* (see Table 1):
- a) Approach: Individual and sustained mentoring. Try and recruit in early undergraduate career and have at least two summers in the traineeship program.

Table 1. WHOI Minority Trainship Program, 1978-1997

Total number of Minority Trainees: (Mostly undergraduates, a few high school students in early years).	African-American	Hispanics (Latinos)	Native Americans	Asian/Pacific Islanders
56	28	13	5	10

3. *Applicant and Acceptance/Appointment Statistics-WHOI Summer Student Fellowship Program* (see Tables 2 and 3):

Table 2: Number of Students

Applicants

Acceptance/Appointment\*

	1993	1994	1995	1996	1997		1993	1994	1995	1996	1997
Male	122	106	120	108	93		11	15	11	12	11
Female	128	128	179	146	139		14	11	18	16	12
Total	250	234	299	254	232		25	26	25	28	23
Minority	11	32	35	26	39		0	5	2	5	1
International	42	34	41	31	15		8	2	2	2	4

Table 3: By Percentage (%)

Applicants

Acceptance/Appointment

	1993	1994	1995	1996	1997		1993	1994	1995	1996	1997
Male	49%	45%	40%	43%	40%		44%	57%	38%	43%	48%
Female	51%	55%	50%	58%	60%		56%	42%	62%	57%	52%

Minority	5%	14%	12%	10%	17%		0%	19%	8%	18%	4%
International	17%	15%	14%	12%	6%		32%**	8%	14%	7%	17%

\* We note that we have experienced increased competition with other REU and Minority in Marine Sciences programs for an overlapping pool of applicants. A small, but increasing number of our offers are not accepted because the applicant has already been recruited elsewhere prior to our offer.

\*\* Anomalous year - atypical of the past ten years.

## IMPACT/APPLICATION

Increasing the opportunities for participation of undergraduates in the nation's ocean sciences and ocean engineering research efforts significantly strengthens the overall research effort and is a wise investment for the future.

## TRANSITIONS

Through national meetings, workshops and personal contacts we share our experiences with faculty and administrators of other academic institutions with "Research Experience for Undergraduate" type programs and graduate programs in ocean sciences and ocean engineering. We introduce students to career opportunities at our own institution, other institutions, government agencies and industry.

## REFERENCES

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Jearld, Ambrose, and John W. Farrington, 1996. "Expanding Opportunities in Ocean Sciences: An Overview of a Recent Workshop," Abstract OS12P-2, paper presented at the 1996 Ocean Sciences Meeting, American Geophysical Union and American Society of Limnology and Oceanography, San Diego, California.

Malcolm, Shirley M., 1996. "Science and Diversity: A Compelling National Interest," *Science* 271: 1817-1819.

Richardson, Earl S., 1995. "Expanding the African-American Talent Pool at All Levels of Education: An Essential Step in Increasing the Number of Minority Scientists and Engineers Holding Graduate Degrees," Paper presented September 11, 1995, Conference to Strengthen the Links Between HMSCU Undergraduates and Oceanic Graduate Studies, Expanding Opportunities in Ocean Sciences Hampton University, Hampton, Virginia.

Spinrad, Richard W. and Arthur R. M. Nowell, 1996. "Advising the Next Generation: Career Opportunities in the Ocean Sciences," Abstract OS12P-1, paper presented at the 1996 Ocean Sciences Meeting, American Geophysical Union and American Society of Limnology and Oceanography, San Diego, California.

## WEB SITE:

Woods Hole Oceanographic Institution that describes the institution educational/internship opportunities: <http://www.whoi.edu>.